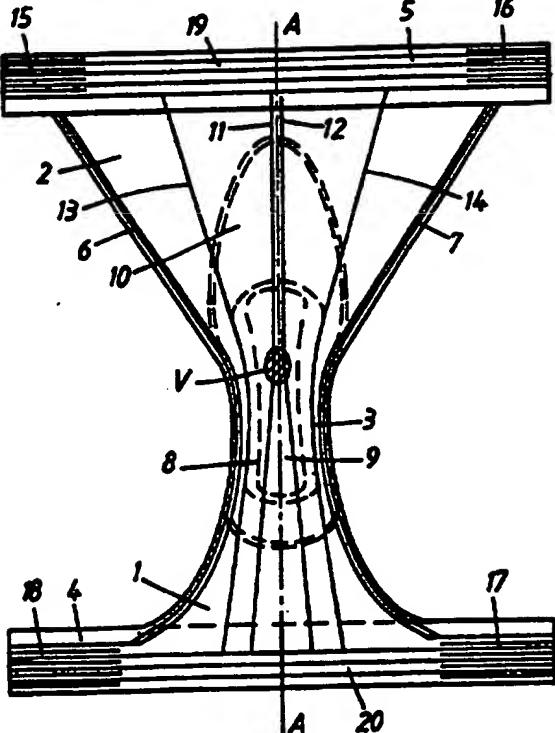


PCT

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International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(54) Title: A PANTY-TYPE SANITARY NAPKIN		
(57) Abstract		
<p>The present invention relates to a pants-type sanitary napkin or incontinence guard for women, comprising a front part (1), a back part (2) and an intermediate crotch part (3), wherein the opposing side parts (15, 18 and 16, 17 respectively) of the front part and the back part are joined together, and further comprising an elastically stretchable waist border or edge (4, 5) which extends peripherally around the free end-edges of the front and the back napkin parts. According to the invention when no load acts on the napkin the elasticized waist border has a greater resistance to stretch in parts (15-18) thereof than in remaining parts.</p>		
		

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**A PANTY-TYPE SANITARY NAPKIN**

- The present invention relates to a panty-type sanitary napkin or an incontinence guard for women, comprising a front part, 5 a back part and an intermediate crotch part, wherein opposing side parts of the front and back parts are joined together, and which further comprises an elastically stretchable waist border or edge which extends peripherally around the free end-edges of the front and back napkin parts.
- 10 The reason why sanitary napkins leak is often because the absorbent body of the napkin is not initially positioned correctly, or because the absorbent body is moved out of its correct position while in use. It is therefore very important that the panty-napkin combination fits well on the wearer, if reliability against leakage is to be achieved. In the case of 15 panty-type sanitary napkins, i.e. panties having an integrated absorbent body, the absorbent body will be positioned correctly when putting on the napkin, provided that the napkin properly fits the wearer. However, the shapes of the bodies 20 of women who use pants-type sanitary napkins vary greatly. For instance the waist measurements of some wearers will vary while having the same buttock sizes, depending on whether the wearer has a straight figure or a more pronounced female shape 25 with broad hips and a narrow waist, and consequently it is difficult to produce pants-type sanitary napkins in a model or a size which will ensure a good fit on users of all sizes. Another problem with poorly fitting napkins is that the folds 30 and wrinkles caused by contraction of the elastic in the packaged state of the napkin are not smoothed out when putting on the napkin. These folds and wrinkles can be seen through the overlying garments of thin or slender users, thereby causing the user embarrassment.
- 35 The object of the present invention is to solve these problems.

This object is achieved in accordance with the invention with a pants-type sanitary napkin or an incontinence guard for women of the kind defined in the introduction which is characterized in that when the napkin is free of load, the  
5 waist border will have a greater resistance to stretch in those parts of the border that are located in the side parts than in remaining parts. Thus, those parts of the waist border which have a lower stretch resistance will be stretched first, while those parts which have a greater stretch resistance will  
10 only be stretched when necessary. It is therewith possible to ensure a good fit for both users who have a straight figure and those who have broad hips and narrow waists. One advantage afforded in this regard is that fewer models or sizes need be produced in order to accommodate variations in the body shapes  
15 of the users while providing a good and snug fit.

According to one preferred embodiment of the pants-type sanitary napkin, the elastic waist border has the form of an elastic band or tape which is fastened while in a stretched state to the free end-edges of the front and back napkin parts and has in those band parts which are located in the side parts of the napkin have a stronger elasticity, or exert a greater elastic strength, than the remainder of the band, and the mutually opposing side edges of the front and back napkin parts are spaced from one another and joined together through band parts of stronger elasticity. The band may advantageously be comprised of a two-layer material which includes one elastic layer and one layer of non-elastic material, said layers being mutually joined in a more sparse bonding pattern  
20 in those parts of the band that are located in the side parts of the front and back napkin parts than in the remainder of the band. Alternatively, the band may be comprised of two different materials each having a different elastic strength  
25 or degree of elasticity.

30  
35 According to a second embodiment, the waist elastic is comprised of a plurality of elastic threads which are fastened

to the free edges of the front and back napkin parts with the threads in a pre-stretched state, wherein a larger number of threads are mounted in the side parts of the front and back napkin parts than in the remainder of the napkin.

5

According to a third embodiment of the invention, the side parts of the front and back napkin parts are spaced from one another and mutually joined by means of an elastically stretchable band, while the remainder of the waist border or edge has a much lower degree of elastic stretchability than the elastic stretchability of the band.

The invention will now be described with reference to the accompanying drawings, in which

15

Fig. 1 illustrates from above a preferred embodiment of an inventive pants-type sanitary napkin, and shows the napkin in a final stage of manufacture prior to joining the front and back napkin parts together;

20

Fig. 2 is a front view of the napkin shown in Fig. 1 worn by a user, after having joined the front and back parts together;

25

Fig. 3 is a view similar to Fig. 2 and shows a second embodiment of an inventive pants-type sanitary napkin; and

Fig. 4 is a schematic perspective view of one side part of the napkin shown in Fig. 3.

30

Fig. 1 illustrates one embodiment of a pair of inventive sanitary panties or pants-type sanitary napkin in a stage of manufacture prior to joining together the front and back waist parts of the napkin. The illustrated napkin includes a front part 1, a back part 2 and an intermediate crotch part 3. The napkin also includes waist elastic which in the illustrated case is comprised of elastic bands 4, 5 which extends along respective edges of the waist-forming parts of the front and

35

the back napkin parts, and also includes leg elastic in the form of elastic threads 6, 7 which extend along the side edges of the napkin between the elastic bands 4, 5. In the case of the illustrated embodiment, two elastic threads are disposed 5 along each side edge of the napkin, although it will be understood that the leg elastic may instead consist in fewer or more threads, or in elastic tape, bands or the like. The Figure also shows in broken lines an absorbent body 8 which is firmly secured to the napkin. The illustrated absorbent 10 body 8 is comprised of a primary absorbent pad 9 and a secondary absorbent pad 10 and is particularly suited for night wear.

The illustrated napkin is also provided with two elastic 15 threads 11, 12 which extend between the elastic bands 4 and 5 of the front and back napkin parts 1, 2 respectively, symmetrically in relation to a central longitudinal line A-A along the napkin. The threads 11, 12 extend from the waist edge or rear edge of the back part 2 parallel with the 20 longitudinal line of the napkin and close proximity of one another, up to a region V in the crotch part 3, this region being located at the user's midriff when the napkin is worn. The threads 11, 12 thereafter diverge from the region V and continue to the waist edge or front edge of the front napkin 25 part 1.

When using a pants-type sanitary napkin constructed in accordance with the embodiment shown in Fig. 1, the parts of the threads 11, 12 that diverge away from the region V will 30 strive to give the absorbent body 8 a basin-like shape within this region, this basin-like shape conforming well with the anatomy of the wearer in said region. The parts of the threads 11, 12 that extend rearwardly and parallel with one another from the region V strive to press a corresponding central part 35 of the absorbent body in between the buttocks of the wearer when the napkin is in use, thereby bringing the absorbent body into positive abutment with the wearer's body, at least within

the crotch part and at the beginning of the back napkin part, therewith making the napkin safe against leakage from the rear of the napkin.

- 5 The napkin illustrated in Fig. 1 also includes elastic threads 13, 14 which are located laterally outside the threads 11, 12 and which extend between the front and the back napkin parts, wherein the threads in the front part are mutually convergent and the threads in the back part are mutually divergent. These  
10 threads also follow the outer contours of the sides of the primary absorbent pad 9 along a greater part of their longitudinal extension. The threads 13, 14 thus ensure that the side edges of the primary absorbent pad will be pressed into tight abutment with the user's body, and will also assist in  
15 ensuring that the secondary absorbent pad will conform to the shape of the user's body. It should be mentioned in this regard that the secondary absorbent pad is thin and very flexible and is intended to provide an additional safety zone for absorbing any leakage that may occur when the absorbent  
20 body is used over a long period, for instance over the whole of one night, and the absorbent capacity of the secondary absorbent pad is therefore relatively small.

- 25 The absorbent body used with the illustrated pants-type sanitary napkin is fastened to the napkin in the manufacturing stage illustrated in Fig. 1, in which the aforescribed elastic elements are in a stretched state. When manufacture of the napkin is complete, the elastic elements will strive to contract to a tensionless state. This results in the  
30 formation of folds or pleats in those regions of the napkin which lie outside the primary absorbent pad 9, and the threads will contract in these regions to an essentially tensionless state. This contraction of the napkin is counteracted by the primary absorbent pad 9 within the region of said pad, to a greater or a lesser extent depending upon the stiffness of the pad. Present-day thin absorbent bodies are very flexible and  
35 will therefore be folded or pleated by the elastic threads,

although full contraction of the threads is prevented. Thus, when the user puts on the napkin, any folds or wrinkles in the absorbent pad 9 will be smoothed out and the pad will lie in abutment with the wearer's body as a result of the elastic force exerted by the threads 11-14. Because of the wearer's anatomy, the absorbent pad 9 will obtain a concave basin-like shape from the region V and forwardly thereof, therewith causing the contraction force exerted by the threads 11-14 in this region to strive to retain the basin-like shape, while those parts of the absorbent pad 9 which lie along the threads will be pressed into sealing abutment with the wearer's body. The parallel parts of the elastic threads 11, 12 also ensure that the part of the absorbent pad 9 which lies rearwardly of the region V will be deformed so as to conform to the anatomy of the user in this region, so that the part of the absorbent body or pad that lies between the user's buttocks will be in sealing abutment with the user's body. In addition to ensuring that the side edges of the absorbent pad 9 will lie in sealing abutment with the wearer's body, the threads 13, 14 also function to prevent folds or bulges forming in the napkin or in the secondary absorbent pad.

The pants-type sanitary napkin illustrated in Fig. 1 is preferably comprised of two layers, which are joined together in some suitable way, for instance by gluing, and the elastic devices are disposed between these layers and fastened thereto by gluing or by welding with ultrasound or by heat-welding. The elastic devices may also be sewn to the napkin.

As before mentioned, the absorbent body 8 illustrated in Fig. 1 is comprised of a primary and a secondary absorbent pad 9 and 10 respectively. The primary absorbent pad 9 is constructed in the same way as a conventional absorbent body of a sanitary napkin and therefore has an absorption capacity which is sufficient to handle the fluid discharged by the wearer over the time period for which the napkin is intended to be used, for instance over a whole night. the absorbent body or

- pad may, for instance, comprise one or more layers of compressed cellulose fluff with or without an admixture of superabsorbent material. The primary absorbent pad 9 may advantageously comprise one or more layers of roll material.
- 5 i.e. absorbent material which has been pre-compressed and treated so as to enable the material to be rolled onto storage reels. Such absorbent pads may be very thin and highly flexible while still having sufficient absorption capacity for use as a night napkin. The secondary absorbent pad 10 has a much larger extension than the primary pad and extends rearwardly over a large part of the back part of the napkin. The primary purpose of the secondary absorbent pad is to enhance security against leakage and the pad will have a given absorption capacity commensurate with this purpose. To this end, the secondary pad may be comprised of tissue, nonwoven or some other roll material. The secondary absorbent pad 10 will also preferably include means for preventing fluid, liquid, from spreading over the surface of the pad. Such barriers may be obtained, for instance, by pleating or crêping the material layer, or with the aid of barrier welds. The use of nonwoven material which includes fibres of so-called superabsorbent material is also conceivable, this material binding the absorbed liquid chemically. However, the secondary absorbent pad will generally have the same flexibility as the material from which the napkin is made, so as to make the napkin comfortable to wear. The secondary absorbent pad must therefore be very thin and will consequently have a highly limited absorption capacity.
- 20
- 25
- 30 The absorbent body 8 comprised of the primary and the secondary absorbent pads is enclosed conventionally between a liquid permeable casing sheet and a liquid-impermeable, conveniently air-permeable backing sheet which, in use, lies against the panty part of the napkin.
- 35 The aforescribed pants-type sanitary napkin is constructed in accordance with Swedish Patent Application No. 9303284-5.

-In order for the napkin to function in the intended manner when used, it is essential that the waist elastics 4, 5 are able to hold the napkin in place on the wearer. Furthermore, it is essential to the aforesaid functions of the elastic threads 11-14 that the front and the back napkin parts are stretched laterally when putting on the napkin.

To ensure this, the waist elastics 4, 5 have different degrees of elasticity, or different elastic strengths, in different parts thereof. This is achieved in the Fig. 1 embodiment by virtue of providing the elastic waist bands 4, 5 with more pre-stretched elastic threads in the side parts 15-18 of said elastic than in the central parts 19, 20 thereof. As a result, the side parts will have a greater resistance to stretch than the remaining parts of the waist elastic. Thus, when putting on the pants-type sanitary napkin shown in Fig. 1, the central parts 19, 20 will be stretched first while the side parts 15-18 will only be stretched when the central parts of said elastic have been stretched to an extent at which the combined elastic strength of the outwardly stretched threads in the central parts 19, 20 is equal to the combined elastic strength of the threads in the side parts 15-18. This ensures that the front and back napkin parts will be stretched in the manner intended before any appreciable stretching of the side parts 15-18 of the waist elastic 4, 5 takes place. Any folds or creases in the front and back napkin parts will also be smoothed out in this way.

Fig. 2 illustrates schematically the pants-type napkin shown in Fig. 1 when worn by a user. Certain parts of the body contours of a user having broad hips and a narrow waist are shown in full lines. As indicated in the Figure, the central parts 19, 20 of the waist elastic are almost stretched to the full, whereas the side parts 15-18 have only been stretched to an insignificant extent. The broken lines in Fig. 2 are intended to show the body contours of a user whose bottom is of the same width as the first-mentioned user, but who has a

straight figure. The additional stretch in the waist elastic required for a user of this shape is achieved through the medium of the side parts 15-18 of the elastic.

- 5 In the case of the aforescribed embodiment, it is only the stretch resistance of the side parts that differs from the stretch resistance of the remainder of the waist elastic. It will be understood, however, that it is also possible to vary the stretch resistance in other parts of the waist elastic,
- 10 for instance so that the elastic in the front part of the napkin will be stretched before the elastic in the back part thereof, or so that the stretch resistance will decrease continually towards the centre part of the waist elastic in the front and/or back part of the napkin.
- 15 In the described embodiment, the different degrees of elasticity, or elastic strength, in different parts of the waist elastic has been achieved by mounting a different number of elastic threads of one and the same kind in different parts
- 20 of the border elastic 4, 5. It will be understood, however, that the different degrees of elasticity can be achieved in other ways, for instance by using elastic threads of mutually different spring characteristics in different parts of the waist elastic or to compose the waist elastic of different
- 25 elastic materials.

Figs. 3 and 4 illustrate a second embodiment of an inventive pants-type sanitary napkin in which the stretch resistance of the side parts of the waist elastic is twice that of an elastic which is comprised of the same material, this being achieved by virtue of using doubled elastic material in said side parts. Such waist elastic can be used with particular benefit in a pants-type sanitary napkin, which is normally manufactured by placing the napkin components on a moving, flat web of material, wherein the individual napkin blanks are cut from the web in a final stage of manufacture and the side parts of the blank cut-outs are joined together to form the

finished pants-type napkin. The desired higher stretch resistance in the side parts of the waist elastic can be achieved readily by giving those parts of the waist elastic that extend out from the front and back parts of the napkin 5 dimensions which will cause the outwardly projecting parts to overlap when joining the waist elastic in the side parts and therewith joining the pants-type napkin together in its entirety. The napkin shown in Fig. 3 differs from the napkin shown in Figs. 1 and 2 solely by the different construction 10 of the side parts. Those reference signs used in Figs. 1 and 2 have been used in Figs. 3 and 4 with the addition of a prime to identify corresponding components. Fig. 4 illustrates one side part of the pants-type napkin and also shows that the parts 15', 18' have been overlapped when joining the napkin 15 together. Naturally, in order for the overlapped parts 15', 18' of the waist elastic to function as an elastic unit, it is necessary to join both ends of the overlapped parts together, for instance by means of a weld join 21, 22 at each end. In addition to affording the advantage of a greater 20 stretch resistance in the mutually overlapping parts of the elasticated waist border, it will also afford the advantage of a strong and aesthetically attractive join in the side parts of the pants-type sanitary napkin. The opposite side part of the napkin is constructed in the same manner.

25 The waist elastic used in a pants-type sanitary napkin according to the invention may also have the form of the elastic band taught by SE-B-500 791. This specification describes an elastic band or tape which is comprised of a 30 first layer of elastic material and a second layer of material which is practically inelastic in comparison with the first layer. Different degrees of elasticity or elastic strengths are obtained in different parts of the band, by joining the two layers together in different bonding patterns.

35 It will be understood that the invention can also be applied with pants-type sanitary napkins of a type different to those

described in the exemplifying embodiments, for instance of the type in which the waist elastic includes elastic threads which are fastened to the outer casing sheets and which do not include the separate elastic bands included in the illustrated 5 embodiments, or in pants-type sanitary napkins in which the side edges of the front and the back napkin parts are joined directly one to the other. Even though it is unnecessary from the aspect of leakage safety or absorption for the front and back napkin parts to extend laterally outwards, the user feels 10 that the napkin fits more snugly when the napkin includes such a feature, which is important from the comfort aspect. The invention is therefore restricted solely by the content of the following claims.

## CLAIMS

1. A pants-type sanitary napkin or incontinence guard for women, comprising a front part (1), a back part (2) and an intermediate crotch part (3), wherein the opposing side parts (15, 18 and 16, 17 respectively) of the front part and the back part are joined together, and further comprising an elastically stretchable waist border or edge (4, 5) which extends peripherally around the free end-edges of the front and the back napkin parts, characterized in that when no load acts on the napkin the elasticated waist border has a greater resistance to stretch in parts (15-18) thereof that are located in the side parts than in remaining parts.  
5
- 15 2. A napkin according to Claim 1, in which the waist elastic has the form of an elastic band or tape (4, 5) which is fastened in a stretched state to the free end-edges of the front and back napkin parts (1, 2), characterized in that the elastic band or tape includes in the side parts of the napkin parts (15-18) which have a greater elastic strength than the remainder of the band.  
20
- 25 3. A napkin according to Claim 2, characterized in that opposing side edges of the front and back napkin parts (1, 2) are spaced apart and joined together through the medium of said band parts (15-18) of greater elastic strength.
- 30 4. A napkin according to Claim 2 or 3, characterized in that the band is comprised of two layers of material, of which one is an elastic layer and the other is an essentially non-elastic layer, and in that the layers are joined together in a sparser bonding pattern in those parts of the band that are located in the side parts of the front and the back napkin parts than in the remainder of said band.  
35
5. A napkin according to Claim 2 or 3, characterized in that the band is comprised of two different materials having

mutually different elastic strengths.

6. A napkin according to Claim 1, characterized in that the waist elastic (4, 5) includes a plurality of elastic threads which are fastened in a pre-stretched state to the free edges of the front and back napkin parts (1, 2); and in that the side parts (15-18) of the front and the back napkin parts have a larger number of threads than the remainder of the waist elastic.

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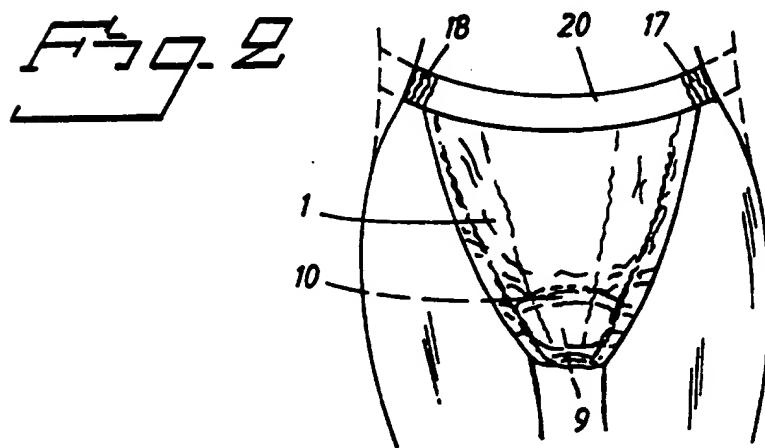
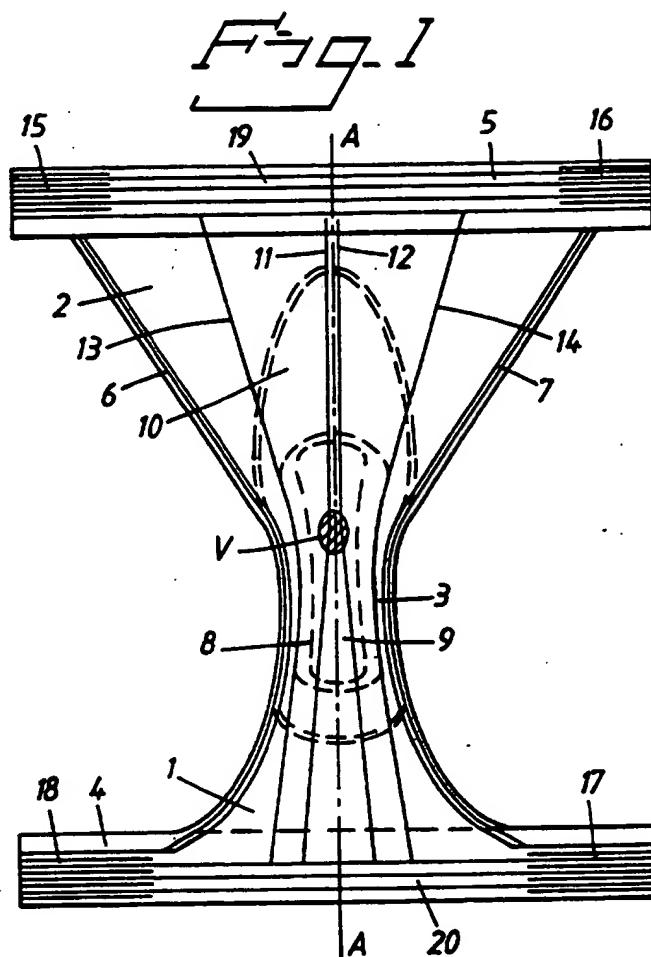
7. A napkin according to Claim 1, characterized in that the side parts of the front and the back napkin parts are spaced apart and joined together by means of an elastically stretchable band; and in that the remainder of the waist elastic has insignificant elastic stretchability in comparison with the elastic stretchability of the band.

15  
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8. A pants-type sanitary napkin or incontinence guard for women comprising a front part (1'), and back part (2') and an intermediate crotch part (3'), and an elastically stretchable waist border or edge which extends peripherally around the free end-edges of the front and back napkin parts, characterized in that the waist border includes parts (15', 18') which project out from the side edges of the back and the front napkin parts and which overlap one another and are joined together along join lines (21, 22) at respective ends of the outwardly projecting parts.

25

1 / 2



2 / 2

FIG. 3

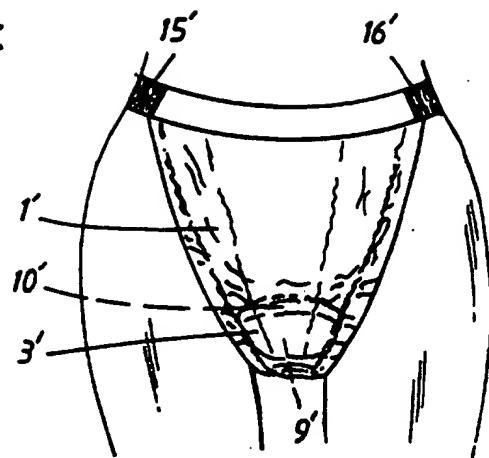
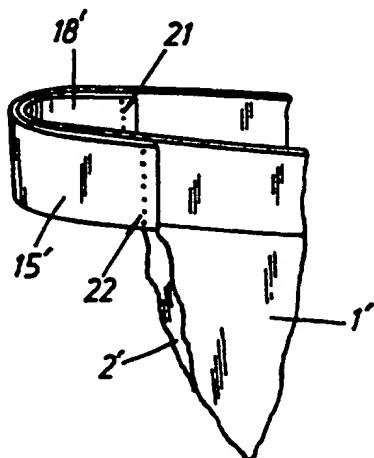


FIG. 4



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 95/01312

## A. CLASSIFICATION OF SUBJECT MATTER

IPC6: A61F 13/56

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: A61F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 9203113 A1 (THE PROCTER & GAMBLE COMPANY), 5 March 1992 (05.03.92), page 10, line 1 - line 21 --	1,7
X	EP 0323634 A2 (KIMBERLY-CLARK CORPORATION), 12 July 1989 (12.07.89), column 9, line 55 - column 10, line 41; column 16, line 25 - column 17, line 22, figures 2,4,5,7,9A, 9B,12C --	1,7,8
A	GB 2244422 A (KAO CORPORATION), 4 December 1991 (04.12.91), page 12, last paragraph - page 13, second paragraph, figures 1,4,5 -----	1-8

 Further documents are listed in the continuation of Box C. See patent family annex.

- \* Special categories of cited documents:
- "A" document defining the general state of the art which is not considered to be of particular relevance
- "B" earlier document not published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed
- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- "Z" document member of the same patent family

Date of the actual completion of the international search

7 February 1996

Date of mailing of the international search report

08 FEBRUARY 1996

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**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/SB 95/01312

**Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos.: because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
  
3.  Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

A pants-type sanitary napkin according to claims 1-7 concentrating on the stretchability of the waist border.

A pants-type sanitary napkin according to claim 8 concentrating on that the waist border includes parts which project out from the side edges of the back and the front napkin parts and which overlap one another.

1.  As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3.  As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  
4.  No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

**Remark on Protest**  

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

05/01/96

International application No.

PCT/SE 95/01312

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
WO-A1- 9203113	05/03/92	AT-T-	111723	15/10/94
		AU-B-	662712	14/09/95
		AU-A-	8305591	17/03/92
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		EP-A,B-	0544703	09/06/93
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